

Claims

What is claimed is:

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1. An array of agents attached to an optical fiber, wherein each agent is attached to a pre-determined portion of the optical fiber.

2. The array of claim 1 wherein the agents are chemical compounds.

10 3. The array of claim 1 wherein the agents are proteins.

4. The array of claim 1 wherein the agents are peptides.

5. The array of claim 1 wherein the agents are polynucleotides.

6. The array of claim 1 wherein the optical fiber is divided into reactant regions.

7. The array of claim 1 wherein the optical fiber comprises a cladding.

8. The array of claim 7 wherein the cladding is a sol-gel matrix.

9. The array of claim 7 wherein the cladding is a polymer.

10. The array of claim 1 wherein the optical fiber is derivatized.

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11. The array of claim 10 wherein the optical fiber is aminopropylsilylated.

12. The array of claim 10 wherein the optical fiber is silylated.

13. The array of claim 1 wherein the optical fiber is coated with at least one layer of cladding.

14. A method of preparing an array of agents on an optical fiber, the method comprising the 5 steps of:

providing an optical fiber with reactive functional groups;
attaching agents to optical fiber.

15. The method of claim 14 wherein the step of providing comprises the steps of:

10 providing an optical fiber; and
derivatizing the fiber to provide reactive functional groups.

16. The method of preparing an array of chemical compounds on an optical fiber, the method comprising the steps of:

15 providing an optical fiber with reactive functional groups;
dividing the fiber into regions;
subjecting each region to reaction conditions so as to attach reactive moieties or to modify the functional groups; and
repeating previous two steps until the desired array of chemical compounds is obtained.

20 17. A method of analyzing an array of agents on an optical fiber, the method comprising the steps of:

25 providing a linear array of agents on an optical fiber, such that the identity of each of the agents is a function of distance with respect to the start of the array;
assaying agents in the array to detect those compounds having a desired activity;
exciting agents with a light source; and
detecting specific agents by reaction to light.

30 18. The method of claim 17 wherein the step of assaying comprises contacting a fluorescent species with the array.

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- 5 19. A system for analyzing an array of agents on an optical fiber comprising:
 an array of agents linearly arranged on an optical fiber;
 a light source to deliver photons to the array; and
 a light detector to receive a signal from the array.
- 10 20. The system of claim 19 wherein the light source is a laser.
- 15 21. The system of claim 19 wherein the light source is a pulsed laser diode.
- 20 22. The system of claim 19 wherein the light source is an LED.
- 25 23. The system of claim 19 wherein the detector is a photomultiplier tube.
- 30 24. The system of claim 19 wherein the detector is a charge coupled device.
- 35 25. The system of claim 19 wherein the detector is a photodiode array.
- 40 26. The system of claim 23, 24, or 25 wherein the detector further comprises a filter.
- 45 27. The system of claim 23, 24, or 25 wherein the detector further comprises a monochromator.
- 50 28. A system for analyzing an array of agents on an optical fiber comprising:
 an array of agents linearly arranged on an optical fiber;
 a light source to deliver photons into the optical fiber; and
 a light detector to receive a signal from the agents on the optical fiber.
- 55 29. A method of analyzing an array of agents on an optical fiber, the method comprising the steps of:

providing a linear array of agents on a first optical fiber, such that the identity of each of the agents is a function of distance with respect to the start of the array;

providing a second optical fiber;

assaying agents in the array to detect those compounds having a desired activity;

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exciting agents with a light source using one of the two fibers; and

detecting specific agents by reaction to light using the other of the two fibers.

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